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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.                   | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------------------|------------------|
| 10/790,769  | 03/03/2004  | Kazunori Yamanaka    | 040094                                | 3203             |
| 23850 7590 02/09/2007<br>ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP<br>1725 K STREET, NW<br>SUITE 1000<br>WASHINGTON, DC 20006 |             |                      | EXAMINER<br>MANCUSO, HUEDUNG XUAN CAO |                  |
|   |             |                      | ART UNIT<br>2821                      | PAPER NUMBER     |
| SHORTENED STATUTORY PERIOD OF RESPONSE  |             | MAIL DATE            | DELIVERY MODE                         |                  |
| 3 MONTHS  |             | 02/09/2007           | PAPER                                 |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/790,769

Applicant(s)

YAMANAKA ET AL.

Examiner

Huedung Cao Mancuso

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted Prior Art (Specification, page 1-3) in view of Tsai et al. (US 2004/0100410 A1) and further in view of Choudhury (US 4,985,400).

As to claim 10, Prior Art teaches an antenna coupling module comprised of a planar antenna and a substrate forming a planar superconductive high frequency circuit arranged in a perpendicular direction with respect to the element surface of said planar antenna and having said planar antenna (Specification, page 1, line 32-page 2, line 30). It is noted that Prior art does not explicitly disclose that said planar antenna and said superconductive high frequency circuit electromagnetically coupled via a space. However, Tsai teaches such electromagnetically coupling via a space is well known in the art see Tsai's claim 3. It would have been obvious to one of ordinary skill in the art at the time the invention was made by having said planar antenna and said superconductive high frequency circuit electromagnetically coupled via a space because without the through hole there're will be no disrupt structural integrity of material. Furthermore, PA and Tsai do not explicitly teach that the oxide

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superconductor for said superconductive high frequency circuit or said planar antenna is at least one type of oxide high-temperature superconductor selected from the group comprised of  $\text{Bi}_{n1}\text{Sr}_{n2}\text{Ca}_{n3}\text{Cu}_{n4}\text{O}_{n5}$

(where,  $1.8 \leq n1 \leq 2.2$ ,  $1.8 \leq n2 \leq 2.2$ ,

$0.9 \leq n3 \leq 1.2$ ,  $1.8 \leq n4 \leq 2.2$ , and

$7.8 \leq n5 \leq 8.4$ ),  $\text{Pb}_{k1}\text{Bi}_{k2}\text{Sr}_{k3}\text{Ca}_{k4}\text{Cu}_{k5}\text{O}_{k6}$

(where,  $1.8 \leq k1+k2 \leq 2.2$ ,  $0 \leq k1 \leq 0.6$ ,

$1.8 \leq k3 \leq 2.2$ ,  $1.8 \leq k4 \leq 2.2$ ,  $1.8 \leq k5 \leq 2.2$ ,

and  $9.5 \leq k6 \leq 10.8$ ),  $\text{Y}_{m1}\text{Ba}_{m2}\text{Cu}_{m3}\text{O}_{m4}$  (where,

$0.5 \leq m1 \leq 1.2$ ,  $1.8 \leq m \leq 2.2$ ,  $2.5 \leq m3 \leq 3.5$ ,

and  $6.6 \leq m4 \leq 7.0$ ),  $\text{Nd}_{p1}\text{Ba}_{p2}\text{Cu}_{p3}\text{O}_{p4}$  (where,

$0.5 \leq p1 \leq 1.2$ ,  $1.8 \leq p2 \leq 2.2$ ,  $2.5 \leq p3 \leq 3.5$ ,

and  $6.6 \leq p4 \leq 7.0$ ),  $\text{Nd}_{q1}\text{Y}_{q2}\text{Ba}_{q3}\text{Cu}_{q4}\text{O}_{q5}$

(where,  $0 \leq q1 \leq 1.2$ ,  $0 \leq q2 \leq 1.2$ ,

$0.5 \leq q1+q2 \leq 1.2$ ,  $1.8 \leq q2 \leq 2.2$ ,

$2.5 \leq q3 \leq 3.5$ , and  $6.6 \leq q4 \leq 7.0$ ),

$\text{Sm}_{p1}\text{Ba}_{p2}\text{Cu}_{p3}\text{O}_{p4}$ . Choudhury teaches those oxide

superconductor is well known in the art see Choudhury (col. 1, line 56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use such oxide superconductor to enhance the signal of the antenna.

As to claim 2, wherein the perpendicular distance of the electromagnetically coupled space has a length of not more than 1/4 of the effective wavelength which Prior

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art does not explicitly disclose. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that various length of electromagnetically coupled space can be used depending upon the desired application in order to improve and strength a performance of the antenna.

As to claim 3, wherein said effective wavelength includes from a microwave to a milliwave band (Specification, page 2, lines 31-36).

As to claim 4, wherein said planar antenna and said superconductive high frequency circuit have a  $\frac{1}{4}$  wavelength type feeder line, respectively as a coupling circuit thereof (Specification, page 3, lines 25-32).

As to claim 5, wherein a dielectric body is arranged between  $\frac{1}{4}$  feeder lines for coupling circuit of said planar antenna and said superconductive high frequency circuit (Specification, page 3, lines 25-32).

As to claim 6, wherein at least one type of ingredient selected from the group consisting of magnesium oxide, mullite, forsterite, titanium oxide, lanthanum aluminate, sapphire, alumina, strontium titanate, magnesium titanate, calcium titanate, quartz glass, polytetrafluoro-ethylene, polyethylene, a polyimide, polymethylmethacrylate, a glass-epoxy composite, and a glass-polytetrafluoroethylene composite is used as the ingredient of the dielectric body (Specification, page 3, lines 4-8).

As to claim 7, wherein an oxide superconductor is used as the conductor of said superconductive high frequency circuit, and said superconductive high frequency circuit has at least one type of circuit selected from the group comprised of a phase circuit,

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0.5.ltoreq.q1+q2.ltoreq.1- .2, 1.8.ltoreq.q2.ltoreq.2.2,

2.5.ltoreq.q3.ltoreq.3.5, and 6.6.ltoreq.q4.ltoreq.7.0),

Sm.sub.p1Ba.sub.p2Cu.sub.p3O.sub.p4 (where,

As to claim 11, wherein said planar antenna is a non-superconductive element which Prior art does not explicitly disclose. However, it is inherent that the planar antenna is made out with non-superconductive element for different kind of antenna system.

Claim 13 is similar in scope to claim 1; therefore, it is rejected for the same reason.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted Prior Art (Specification, page 1-3) in view of Tsai et al. (US 2004/0100410 A1) and Choudhury (US 4,985,400), and further in view of Shen (High temperature superconducting microwave circuits).

Claim 12 adds into claim 1, wherein said superconductive high frequency circuit or said planar antenna is cooled to not more than 100K which none of the above prior art explicitly teach. However, Shen teaches the superconductive high frequency circuit or the planar antenna is cooled to not more than 100K is well known in the art (Shen, pages 104-105). It would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of teaching of Shen to configure Prior art's antenna system as claimed, doing so it would help to get the desired frequency needed.

Due to the new ground of rejection this action made NON-FINAL.

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***Inquiries***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huedung Cao whose telephone number is (571) 272-1939.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Owens, can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

5. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Huedung Cao  
Patent Examiner

